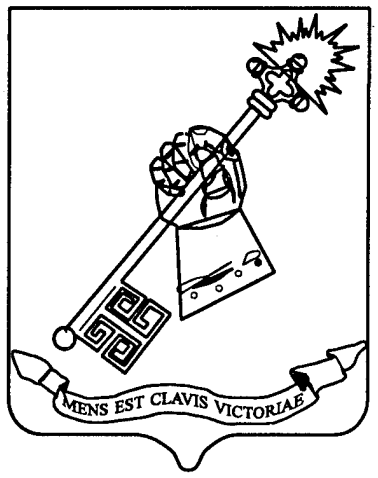
BATTLESPACE
Synergizing The Campaign

A Monograph
By
Major David B. Pistilli
United States Air Force



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MONOGRAPH APPROVAL

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Approved by:

LTC Russell W. Glenn, MSSM, MSCE, MSOR, MMAS — Monograph Director

COL Gregory Fontenot, MA, MMAS — Director, School of Advanced Military Studies

Philip J. Brookes, Ph.D. — Director, Graduate Degree Program

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ABSTRACT

BATTLESPACE: SYNERGIZING THE CAMPAIGN
by Major David B. Pistilli, USAF, 51 pages

The purpose of this monograph is to investigate each service's perspective of the battlefield to understand how those views can be integrated for maximum joint effect. Its thesis is that battlespace can be an enabling concept that facilitates this integration.

The author summarizes each service's definition of battlespace and what the definition *means* to each -- what the implications of the definition are for how the army, navy, air force, and marine corps approach their fight. The survey finds literal definitions and doctrinal discussions of battlespace for the army and navy; the marines share a definition with the navy and are developing doctrine for the concept. The air force does not define the term. However, whether or not there is a literal definition for the term, each service's doctrine contains elements of the battlespace concepts treated in the army and navy definitions: space, time, synchronization, unity of effort, and dominance. The marine corps adds an electromagnetic dimension to their battlespace. The comparison concludes that battlespace represents both the physical environment of the battlefield and an intellectual vision of the same for each service.

The author provides a joint definition of battlespace, a definition currently not found in the joint doctrine. The addition of battlespace as a bona fide joint doctrinal concept could serve three purposes. First, it could add to the current "concepts of operational design" -- center of gravity, lines of operation, and culmination -- as an operational planning tool that assists the synchronization and integration of joint forces and effort on the battlefield. Second, it could inspire a battlefield organization along lines that promote unity of effort for a particular mission, such as close, high, deep, rear, and so forth. Third, it can promote broader air, land, and sea "mindedness" for the joint force commander and among his subordinate component commanders.

The net effect of joint use of the battlespace concept should be a synergy that maximizes the combat power of the joint combat team. The desired end state is a cohesive effect that unites the efforts of the individual services.

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Introduction

Battlespace is an alluring term, at once tangible but amorphous. The two component words are simple enough -- battle and space -- yet ask someone to explain the term and the response normally consists of vague descriptions that include vision, perception, linear distance, time, volume, malleability, form, and formlessness. In short, it conjures an image of fighting in exotic dimensions.

Yet the term was surely carefully chosen, most probably for the concepts those responses enumerate. Battlespace is a term whose usage roughly coincides with the emergent emphasis on the operational level of war. As such, it should be an enabling term for the operational planner's art.

It indeed can be. "Battle" is "an encounter between opposing forces...armed fighting...combat...a protracted controversy or struggle."[1] This is the realm of the operational artist, who "employ[s] military forces to attain strategic goals through the design, organization, integration, and execution of battles and engagements into campaigns and major operations."[2] "Space" is more complex. It can be "the infinite extension of the three-dimensional field in which all matter exists."[3] Given a boundary, it can refer to "the region of this expanse beyond Earth's atmosphere."[4] More tightly bounded, it can be "a blank or empty area...provided for a particular purpose."[5] In certain

use, it can be "a period or interval of time."[6] These, too, are the purview of the operational artist, whose palette includes the operational dimensions of "time, tempo, depth, and synchronization."[7] The term thus encompasses the concepts in terms of which the operational planner thinks to accomplish his craft.

Notably, battlespace is either defined differently or simply not defined by each of the US military services. The US Navy has the most succinct yet broad definition: battlespace is "all aspects of air, surface, subsurface, land, space, and the electromagnetic spectrum that encompass the area of influence and the area of interest."[8] The US Army has a longer yet more oblique definition:

> Components determined by the maximum capabilities of a unit to acquire and and dominate the enemy; includes areas beyond the AO [area of operation]; it varies over time according to how the commander positions his assets.[9]

Neither the US Marine Corps nor the US Air Force define battle space per se, but both hint at the concepts contained in the army and navy definitions. The marine warfighting philosophy of "maneuver warfare" stresses the combination of maneuver in space *and* time to gain both "positional" and "temporal advantage."[10] The air force "role" of "aerospace control (control of the combat environment)...encompasses all actions taken to secure and control the aerospace environment and to deny the use of that environment to the enemy."[11] Joint

doctrine is, for the time being, silent on the topic of battlespace.

Definitions aside, the services appear to perceive battlespace in a manner that is often similar to each other's, and sometimes overlapping.[12] For example, the navy and marine corps share a notion of mobile, shifting, multiple "zones of superiority" that "surround" their forces and serve as a "base" from which they "project power."[13] Aerospace control for the Air Force is strongly analogous to "battlespace dominance" for the Navy and Marine Corps: "The degree of control over the dimensions of the battlespace that enhances friendly freedom of action and denies the enemy freedom of action."[14] All of the services bound their vision by the capabilities of their sensors, their weapons, and their adversaries' sensors and weapons. These capabilities increasingly overlap on the modern joint battlefield.

These definitional differences and overlapping perceptions present a series of challenges for the modern joint force. The first challenge is to avoid confusion over a difference in terminology or fundamental understanding of the term battlespace. The second challenge is to eliminate duplication of effort or unintentional oversight on the battlefield that could result due to a shared battlespace. The third challenge is to prevent service component resentment over inclusion or exclusion in mission assignment in a theater of conflict. The fourth challenge is to

minimize unnecessary peacetime competition over roles, missions, and functions among the services in a jockeying to have their vision of battlefield dominance prevail uniformly.

A common understanding and overlapping perception of battlespace can also be an opportunity for synergy on the joint battlefield. The concept of "battlespace" seems to offer an intellectual construct for maximizing combat potential. The concept should free the commander and his staff from constraints -- present a "blank sheet of paper" -- allowing him to conceive a plan that visits maximum effect on an adversary. This concept:

1. Can visualize a "physical volume" defined by the "breadth, depth, and height" through which a commander can "acquire" an adversary by surveillance and reconnaissance, and "engage" an adversary by fires or other direct action.[15]

2. Views the enemy as a whole, not as subsets that will theoretically enter a drawn boundary or cross a specified control measure.

3. Includes the "combat power of all friendly forces"[16] as a total capability available to counter an adversary.

4. Prescribes "unity of effort" as opposed to "ownership of assets".[17]

Theoretically, this should allow each component to plan freely, using their vision of their battlespace. A commander could then implement those visions selectively, using individual services where their

vision is most effective, and blending visions where a combination achieves a synergism.

This synergism is crucial. While fighting as a joint force is not new, current and future conflict places a premium on joint effectiveness. Emerging force structure points toward a reduced force, modular in organization, only moderately redundant, logistically lean, and based in the CONUS. Joint task forces will be built from these modules and deployed using scarce strategic lift for entry into perhaps immediate combat.[18] Such a force will have to be the right blend, in the right quantity, in the right sequence to generate maximum combat power quickly and decisively, and to sustain that power for the duration of the fight.

This paper, then, will explore the concept of battlespace to answer two primary questions. First, how does each service view its battlespace? Second, can joint doctrine synthesize those views for a synergistic battlespace that integrates service orthodoxy, methodology, and capabilities when constructing the campaign? The answers to these questions should illuminate the strengths, weaknesses, and utility of the concept for the joint force commander.

What Does Battlespace Mean To Each Service?

Army Perspective

The army has the most intellectually developed concept of battlespace. The aforementioned definition, literal in character, is incomplete. In further

development, battlespace is composed of at least three distinct components: one, the larger doctrinal framework within which the concept resides; two, the shape, dimensions, measurements, and boundaries of the space; and three, the intent for the use of the concept in operations.

For the army, battlespace is conceived inside a broader "battlefield framework" that also includes the concepts of "area of operations" and a deep, close, and rear "battlefield organization."[19] The *area of operations* (AO) is

> A geographical area assigned to an Army commander by a higher commander--an AO has lateral and rear boundaries which usually define it within a larger joint geographical area...Within the AO, the JTF commander has the authority to control and synchronize the timing, priority, and effects of joint force actions consistent with this higher commander's intent and concept.[20]

The *battlefield organization* consists of

> Deep operations...directed against enemy forces and functions beyond the close battle...to nullify the enemy's firepower, disrupt his supplies...break his morale...[and] set the conditions for decisive future operations.
>
> Close operations...[involving] forces in immediate contact with the enemy...usually the corps and division current operations.
>
> Rear operations...providing freedom of action and continuity of operations, logistics, and battle command. Their primary purposes are to sustain the current close and deep fights and posture the force for future operations.[21]

Battlespace completes FM 100-5's battlefield framework

trinity. Its existence within this framework has two implications. First, battlespace provides an intellectual bridge between the area of operations and the battlefield organization, two structured and hierarchical concepts. The area of operations is a logical solution to a span of command and control problem. It assigns terrain and mission for planning and execution. The battlefield organization is a logical solution to the problem of commanding and controlling operations in depth. Yet, each can be confining in its own way. An area of operations is imposed by a higher commander and may not account for how the view changes from a lower perspective, may not be carved in a manner that facilitates mission accomplishment, and may construct an invisible "wall" that restricts creative thinking for cross-boundary problems. The battlefield organization may unwittingly confine the different people working those cells to think only in terms of their portion of the battlefield even though the construct is intended to be fluid and linked. Battlespace links these constructs, rooted in command and control realities, with a freedom to visualize and plan in a relatively constraint-free environment.

The second implication for battle space as an element of the battlefield framework is the notion that the JTF commander has the responsibility within an area of operations to prioritize and synchronize the effects of joint force actions. Synchronization implies the

operational elements of time, tempo, and space. This is intuitive but difficult in practice. By first viewing the battlefield conceptually, both inside and outside the AO, the commander can envision the effects of a unified effort against an adversary. The concept of battle space might again serve as a bridge between a difficult problem and a difficult solution.

The second doctrinal component of battle space is its shape, dimensions, measurements, and boundaries. Army doctrine envisions

> "A physical volume that expands and contracts in relation to the ability to acquire and engage the enemy. It includes the breadth, depth, and height in which the commander positions and moves assets over time."[22]

This invokes a hemispherical image with corresponding measurements of three-dimensional distance and volume. Time represents a fourth dimension.[23] The battle space is bounded not by geographic unit boundaries or control measures but by the capabilities of the force's own sensors and weapons. Importantly, this "includes the combat power of all friendly forces that can be brought to bear on the enemy, including joint and combined forces."[24]

There are three intellectual implications of this physical construction. First, a three dimensional image encourages the commander to think in terms of the air -- perhaps aerospace -- as well as the ground. Second, the added dimension of time reinforces the intuitive notion of arranging forces in both space and time. Third, the

intellectual suspension of an imposed boundary encourages the commander to think outside of his "sandbox" -- his area of operations -- and instead on the effects his sensors and weapons can visit on an adversary at their most effective range. Further, these effects are not only those of his sensors and weapons, but those of his joint, combined, and contiguous area of operations partners as well. The net effect should be an intellectual expansion that again bridges difficult battlefield realities with planning solutions.

The final doctrinal component of army battle space is the intent for the concept's use. There are at least three elements in this intent: to help build vision, to secure unity of effort within the battle space, and to dominate the battle space by shaping friendly freedom to acquire and engage targets while restricting an adversary's ability to do the same.

An expanded vision of the battlefield has been implied in previous discussion. FM 100-5 states this intent most clearly:

> [Battle space] is based on the notion that commanders expand their thinking to develop a vision for dominating the enemy and protecting the force before any mental constraints are emplaced , such as overlays depicting phase lines, boundaries, and arrows. This gives them complete freedom of thought to build a broad vision according to existing factors of METT-T.[25]

Unity of effort is a requisite for effective use of all friendly forces. Again, FM 100-5 states this intent best:

Unity of effort is essential to operations

> within a given battle space. Ownership of assets is less important than application of their effects toward an intended purpose. In that way, battle space can overlap, shared by two adjacent commanders who perceive ways to employ their respective assets to mutual advantage.[26]

Shaping friendly battle space while contracting adversary battle space is a theme that resonates through such modern concepts as stealth technology and information operations. It is a classic theme, though, accomplished through a comparison of friendly and adversary strengths and weaknesses. Once an analysis determines how friendly strength will exploit enemy weakness -- whether that strength exploits an advantage in maneuver, firepower, protection, or leadership -- the battlespace needs to be shaped to maximize the asymmetry and minimize an adversary's ability to even the balance. Thus, an army might maneuver at night to exploit a night operations advantage or operate at high tempo to exploit a command and control advantage. Simultaneously, an adversary's vision might be obscured by smoke or his command and control system disrupted or destroyed. These are not new but simply demonstrative examples of an intellectual concept -- battlespace dominance.

One illustration of battlespace concept use is the planning and execution of the 1st Brigade, 1st Infantry Division (Mechanized) breaching operation as part of the division's deliberate attack into Kuwait on 24 February 1991.[27] Uncertain at first about their final mission, their enemy, total numbers of friendly troops, the

terrain and weather, and the time available (METT-T), the brigade intuitively applied the concept of battle space to facilitate their planning. Instead of working from the bottom up -- noting their unit boundaries, parceling out terrain and missions to their subordinate battalions and companies, and the like -- the brigade focused on the mission of their higher headquarters and the nature of the breaching mission they knew they were likely to receive. As the brigade flowed into theater and then to assembly areas, the brigade "transition[ed] quickly from an abstract vision of the battlefield to concrete operational plans."[28]

1st Brigade preparation for their mission demonstrated at least two other tenets inherent in the concept of battlespace. First, the commander assumed a three-dimensional, joint view of the battlefield, where air forces would be combined with organic brigade and divisional fires to attack his enemy "simultaneously throughout the depth of their positions."[29] Further, the commander exercised unity of effort in accomplishing this, asking for and apparently receiving some ability to manage airspace directly affecting his brigade. Second, the brigade "focused on enemy units."[30] This gave the brigade an enemy orientation rather than a terrain orientation during a breaching attack, an operation that naturally invited focus on terrain. By having an enemy focus, the brigade sought to shape and dominate the battlespace by exploiting their advantages -- range and lethality -- and sought to neutralize or

mitigate enemy capability, such as chemical weapons. The net effect was a successful breach, with unknown numbers of Iraqis killed, more than 450 Iraqis taken prisoner, and relatively low friendly losses -- three killed and four wounded.[31]

Navy Perspective

The navy takes a more physically-oriented view of battlespace. For the sailor, to think in terms of a battlespace reflects an intuitive volumetric view of the naval battlefield. Naval doctrine on battlespace describes the physical environment for its forces, defines the dimensions and bounds of that environment, and considers the battlespace as a volume on which they focus their efforts for control.

The navy operates in a complex physical environment that includes operations on, above, and below the surface of the oceans for sea warfare; operations on and above the littorals for land warfare; and operations in air and space for aerial warfare. It is not uncommon for a naval force such as a carrier battle group to conduct sea, land, and aerial warfare simultaneously. To describe this complicated and busy environment, the navy defines the battlespace in terms of spatial, time, and electromagnetic dimensions.

The volumetric concept of space is a natural one for a service which operates in its three planes: breadth, depth, and height. Uniquely, the navy is the only service with a negative component to the y-axis of that dimension, the subsurface of the sea. That y-axis

extends from beneath the surface of the sea to exoatmospheric space, where the navy operates communication and navigation satellites and potentially flies intercontinental ballistic missiles.

Time is an important component of the naval battlespace in that it defines a temporal relationship between points in the space, as well as depicts tempo of operations within the space.

Inclusion of the electromagnetic spectrum as a dimension of the battlespace makes the navy unique in its definition. The electromagnetic spectrum is the medium through which communications, weapons system control, and electronic warfare are conducted. By including the electromagnetic spectrum as a dimension of the battlespace, the navy draws immediate attention to the virtual highway system by which information moves on the modern battlefield. One might argue whether the spectrum is a bona fide dimension or not, but this attention is an important expansion of perspective for the commander viewing modern battlespace.

Naval battlespace is shaped by both friendly and enemy capabilities, and friendly scheme of maneuver. The official definition lists this as the sum of the "area of interest" and the "area of influence." The area of interest is:

> That area of concern to the commander, including the area of influence, areas adjacent thereto, and extending into enemy territory to the objectives of current or planned operations. This area also include areas occupied by enemy forces who could jeopardize the accomplishment of the mission.[32]

The area of influence is:

> A geographical area wherein a commander is directly capable of influencing operations by maneuver or fire support systems normally under the commander's command or control.[33]

This can be a large sum. The area of influence is normally a subset of the area of interest, serving to focus the commander and his staff on what they can affect with organic capability. By extending vision to the natural area of interest, the battlespace broadens the commander's outlook. This includes both friendly and enemy capabilities to influence his battlefield, and how either might help or hinder him.

The final elements of the naval environment are its mobility and malleability.[34] Most naval forces, unlike their land and air counterparts, operate for extended periods without reliance on a static base of operations. Instead, a naval force moves the base with itself as it travels; it views this mobile base as the center of a continually shifting battlespace. The battlespace can be changed to secure objectives or strike targets. For example, an aircraft carrier battle group extends a notional sphere of protection around itself; it will shape that sphere to protect a strike force attacking beyond the normal boundary of the sphere. For the navy, the battlespace both moves and changes shape continuously.

Naval battlespace is a volume that becomes the focus for efforts to defeat an adversary. Indeed, naval officers tend to habitually link the concept of

"battlespace" with "dominance."[35] The navy views battlespace as

> ...zones of superiority, surrounding one or more units of the entire force, that are ... regions in which we maintain superiority during the full period of our operations by detecting, identifying, targeting, and neutralizing anything hostile that enters or passes through.[36]

By focusing on dominance, the navy focuses on its adversary, and on denying that adversary effectiveness within the friendly battlespace. This is a subtle but important element of the battlespace concept -- to think of the space not only as the area controlled by friendly capability but additionally as the area in which an adversary must be controlled for force protection and successful actions on the objective.

An illustration of the complexity of dominating the naval battlespace is the difficulty experienced by the naval task force Britain assembled to confront the Argentinean invasion of the Falkland Islands in 1982. The task force, composed of 13 combat ships early and swelling to some 49 combat ships by conflict's end -- plus 59 transport, supply, and other support ships -- prosecuted combat at sea, in the air, and on land.[37] The task force ultimately prevailed in retaking the Falklands, but did so with an uneven record of dominance in space, time, or the electromagnetic spectrum.

The task force faced at least three battlespace dominance tasks: the enforcement of a series of "exclusion zones" around the Falkland Islands and Argentina proper, the achievement of air and naval

superiority in the vicinity of the Falklands, and the projection and protection of amphibious forces onto the islands proper. The British Navy did reasonably dominate the surface and subsurface dimensions of their battlespace in enforcing the exclusion zone and establishing sea superiority, insofar as opposing surface and subsurface forces are concerned. The Argentine cruiser *General Belgrano* was sunk, as was an intelligence trawler, two patrol boats, and a submarine.[38] For the most part, the Argentine navy declined surface and subsurface battle. No surface or subsurface Argentine ship damaged a British one. Aerially, however, the task force fared less well.

The Argentine air force did not decline battle; rather, they attacked British shipping forcefully, if fitfully. Although they suffered heavy losses themselves -- as many as 109 various aircraft were claimed destroyed by the British -- the air force exacted a heavy toll, sinking six ships and badly damaging ten more.[39] There were a number of reasons for the British inability to dominate in the air: no consolidated air command and control system to provide surveillance and direction to the air fight; a woefully inadequate number of aircraft able to travel with or support the task force; incoherent, incapable, or unworking air defense systems; neither the sustained capability nor the political will to attack mainland Argentine air bases; and, ultimately, a poor estimate of the extent of the air threat to begin with.[40]

The net result was a sort of air parity in which the British decided to risk amphibious operations without overpowering air cover. The wisdom of this decision, while borne out by the Argentine capitulation, could easily have worked against the British force. Lack of a coherent Argentine air plan, a less-than-committed Argentine ground and naval force, and plain good luck aided traditional British resolve and pluck. None the less, the amphibious operation was not power projection involving a dominated battlespace.

Air Force Perspective

Air Force doctrine does not formally define battlespace but presents battlespace-like principles while defining the "aerospace environment,"[41] control of that environment, and projection of power from that environment. Specifically, the doctrine describes the characteristics and bounds of the aerospace environment, presents the importance and methods of controlling that environment, and views the payoff of such control as the ability to project power decisively from that environment.

Air Force doctrine defines the aerospace environment as distinct from the land and sea environments, free from physical obstructions or the concerns of trafficable terrain or waters.[42] Aerospace represents a "third [spatial] dimension" for warfare bounded only by the earth's surface; no altitude or lateral boundaries confine it.[43] For air forces, the elevation of the spatial dimension is its outstanding

attribute, bringing the "qualities" of "perspective, speed, range, and three-dimensional maneuverability."[44] That is, aerospace forces operating in this dimension bring broader perspective, greater speed, longer range, and extreme agility. These qualities, argue the doctrine, make the aerospace environment unique.

Controlling the aerospace environment "normally should be the first priority of aerospace forces."[45] This aerial mantra recognizes the simple reality that denying an enemy use of the aerospace environment while reserving it for oneself facilitates overall mission accomplishment in three ways.[46] First, it protects all elements of the friendly force. Second, it allows the aerial force to accomplish the full range of its roles and missions. For the role of force projection, this includes the missions of strategic attack, interdiction, and close air support.[47] For the role of force enhancement, this includes the missions of airlift, spacelift, refuel, electronic combat, surveillance, reconnaissance, and special operations.[48] Third, it levers use of aerospace to achieve multiplicative effects from the application of force in all environments: land, sea, and air. That is, forces operating in an environment of a controlled aerospace can free aerospace protection forces to better accomplish an offensive minded objective, and can do so in concert with each other. By first controlling the aerospace environment, or weighting that effort, air forces contribute to synergy across the battlefield.

Leaders vary that degree of control in space and time to fulfill theater objectives.[49] Absolute control is an ideal -- it renders moot any requirement for lesser control -- but is rarely achieved.[50] Realistically, air forces seek the control required to accomplish different missions. As examples, an infiltration requires small but intense control; a strategic attack requires broader but still focused control; air superiority to confidently accomplish an amphibious invasion requires nearly complete control.[51]

An air force accomplishes this control with a strong focus on denying an adversary use of the aerospace environment. Offensive counterair and counterspace missions "seek out and destroy enemy aerospace forces at at time and place of our own choosing."[52] Defensive counterair and counterspace missions "detect, identify, intercept, and destroy enemy aerospace forces attempting to attack friendly forces."[53] These missions concentrate on "warning and control systems", "air bases and launch facilities", "surface-based aerospace defenses", and enemy aerial forces in the actual conduct of their missions.[54] Offensive operations are preferred for the initiative they afford and greater payoff they bring. Focus on denying an adversary use of aerospace implicitly expands friendly ability to use the same space.

The payoff of such control is the ability to project decisive aerial power. "Control is an enabling

means rather than an end in itself."[55] A textbook example of this control was the opening phase of air operations in Desert Storm. Initial joint and combined air efforts followed a dual strategy: defeat the command and control of the integrated air defense system (IADS) and defeat its weapons, both ground and air based. To that end, coalition air strikes targeted the sector and regional surveillance and intercept operations centers for the IADS; attacked the radar guided surface to air missile (SAM) sites; cratered the runways at key airfields; and conducted offensive fighter sweeps over the fighter bases known to shelter Iraqi air superiority aircraft.[56] The strategy was effective: Iraqi flights dropped from 120 on the first day of Desert Storm to 40 the following day; the average number of Iraqi flights (including the exodus to Iran) for the remainder of the war fell to roughly ten per day.[57] For the friendlies, aircraft lost or damaged dropped from 17 on the first day to three the following day, with an average of approximately two per day thereafter.[58] Of the total 38 aircraft lost and 48 damaged over the course of the war, only 29 percent of the losses were caused by Iraqi aircraft or radar-guided SAMs.[59]

The result was freedom of action for strategic attack and attack on Iraqi surface forces. The majority of these flights were conducted under conditions of air supremacy, "that degree of air superiority wherein the opposing air force is incapable of effective

interference."[60] This supremacy allowed both a vast majority of the air effort to be devoted to strategic attack and surface force attack, and for such attack to be optimally effective. Air control consumed only 14 percent of coalition air strikes; strategic attack, 15 percent; and attack of Iraqi ground forces, at least 56 percent of all strikes.[61] Without the efficiency of supremacy, a higher proportion of effort would have been necessary for air control, and power projection in all mediums -- air, sea, and ground -- would have become more difficult and less effective.

Marine Corps Perspective

Marine doctrine is sparse on literal definition of battlespace but rich with battlespace-related concepts. The doctrine depicts the process and importance of "conceptualizing the battlefield,"[62] describes the operational dimensions of time and space, organizes the battlespace with a framework to assure order, and views the space as the focus for domination and power projection.

The marine "conceptualizing the battlefield" entails forming a mental image of its essential attributes and then "think[ing] through"[63] the interaction between positive action and those attributes. The attributes could include size, shape, terrain, forces, weapons, capabilities, noncombatants, and mission. This mental image, and then mental analysis, become an intellectual construct for the formation of a combat plan. In the process, the planner

or commander exercises *coup d'oeil* as he strives to understand his enemy's view of the same battle field, and seeks to "shape the battle" such that the outcome becomes inevitable.[64]

The enemy view of the battle field is an important component of the conceptualization. Not only does it point to possible enemy courses of action, it highlights friendly vulnerabilities.[65] This knowledge will drive actions to protect the force and preserve friendly options by mitigating vulnerabilities.

Finally, conceptualization "shapes" the battlefield by working backward to plan actions that conclude with a desired result.[66] Marine doctrine calls this the "vision of how we intend to win."[67] By focusing on decisive results through intermediate actions, and with constant reassessment, the ideal shaping of the battlefield leads to the theoretically inevitable finish -- friendly victory.[68]

Space and time -- the operational dimensions of the battlefield -- appear frequently in marine doctrine. Three concepts for dominating in these dimensions stand out in the doctrinal discussion: speed, timing, and maneuver.

Speed relates to both space and time and is a measurement of how quickly one can move or operate on the battlefield. "Speed over distance, or space, is velocity -- the ability to move fast."[69] Likewise, "speed over time is tempo -- the consistent ability to

operate fast."[70] Velocity and tempo are considered "sources of combat power"; speed is thus considered a "weapon."[71]

Timing is the ability to concentrate decisive combat power at a decisive location at the decisive moment.[72] Timing varies in space and over time to modulate velocity and tempo.

Maneuver combines speed and timing to accomplish such decisive concentration. Maneuver is typically considered and executed in terms of space: envelopment, turning movement, and so forth. Implicit in these spatial maneuvers is skillful use of time. In fact, time can be its own maneuver medium. A fighter pilot might successively maneuver his adversary into a position of low energy from which the foe requires time to extricate himself.[73] This time is then spent attacking the foe while he is most vulnerable. Similarly, operating at a tempo that an adversary can not match, either with respect to physical activity or command and control, is maneuver in time.[74]

Once constructed conceptually, marine battlespace is organized via a "command and control organization and C2 support system into a *framework* that orders the battle, provides control measures, and integrates the MAGTF's efforts..."[75] (emphasis added). The intent of such a framework is to unify deep, close, and rear operations.[76] It is instructive to note that this organization comes *after* the conceptualization.

The final battlespace concepts are dominance and power projection. "Control and domination of battlespace is the heart of naval expeditionary warfare."[77] Dominance in the battlespace is achieved in the manner earlier discussed: shaping the battle in time and space through speed, timing, and maneuver. Dominance of the battlespace is a prerequisite for the ability to project power from that space -- indeed, to alter the space to envelop the projected force should that be necessary. This "Navy-Marine strategy...ensures the effective transition from open ocean to littoral areas and from sea to land and back again."[78]

An example of the transitional nature of marine battlespace is the littoral noncombatant evacuation operation (NEO). A marine force must establish an off-shore presence, project power and establish dominance on-shore, and withdraw back upon its off-shore base at the conclusion of land operations. One such predominantly marine NEO was Operation SHARP EDGE, conducted in Monrovia, Liberia from 25 May 1990 to 9 January 1991.[79] The task force constructed to conduct the NEO consisted of an amphibious squadron; its embarked marine expeditionary unit (MEU) with organic ground combat, air combat, and combat support elements; and an attached destroyer.[80] These forces easily dominated the sea and air environments of the battlespace, with no hostile navy or air force to contend with. The challenge was to dominate the land environment of the battlespace, with geographically

separated sites harboring noncombatant Americans, as well as the citizens of other nations who had requested American assistance.[81]

The marines dominated in the land environment by first thoroughly conceptualizing the battlefield. The task force deployed a very small "forward command element" (FCE) in advance of the main body to establish contact with the American embassy, report to the task force on the situation, and begin preparation for the protection and evacuation of noncombatants.[82] The FCE provided information that allowed prompt combat planning for the enroute task force, resulting in a plan that was able to be executed immediately but was delayed for two months during a period of relative stability.[83] Those two months allowed construction of detailed models of the physical evacuation locations, as well as numerous rehearsals.[84] When forces were finally landed on 5 August 1990, all elements had a clear image of the physical circumstances they were confronting.

The task force then dominated the time, space, and electromagnetic dimensions of the battlespace. In time and space, the marines exploited the helicopter, a transportation technology available to only them in this conflict. Near simultaneous vertical insertions into and evacuations from two communications sites, and vertical insertion into the embassy compound left any adversary no time to react and spoil the landing. At the embassy compound, the landing force initially reinforced compound security, was built rapidly, and

then pushed out to secure key terrain in the vicinity of the compound.[85] These actions provided a protective zone around the embassy compound that was kept essentially constant for the remainder of evacuation operations. Electromagnetically, the force again exploited a technology advantage, this time in communications and intercept. The force was able to command and control separated forces via different radio media, and to augment understanding of enemy activity via radio intercept.[86] Both transportation and electromagnetic technology advantages -- and the doctrine, training, and leadership for their use -- allowed marine maneuver to decisive points well inside their adversaries' decision cycles and maneuver abilities.

Can Battlespace Be Joint?

Comparison

This doctrinal survey of battlespace reveals numerous similarities among the services on the topic. These involve battlespace shape, geometry, dimension, and use.

The army develops the term both physically and conceptually. Physically, battlespace represents a "volume" within which a commander "positions and moves assets over time."[87] Positions in the volume are defined in both space and time; the volume's shape and size are defined by the positioning and capabilities of the forces inside it. The volume supplements both the "area

of operations" assigned to the commander and the "deep, close, rear" tactical "battlefield organization."[88] Conceptually, the battlespace is a three-plane spatial and temporal vision of the battlefield unfettered by boundaries and control measures. The intent is a focus on dominating an enemy within it through unity of effort and synchronization. Both the physical and conceptual blend into a meaning useful to both planning and executing the battle.

The navy views the battlespace most physically, naturally reflecting a battlefield that exists on three spatial planes: on, below, and above the surface of the seas. Time is an important element of the physical battlefield as is the electromagnetic spectrum, an unseen but increasingly important dimension on the modern battlefield. The space is shaped and bounded by friendly and enemy placement and capabilities and is inherently mobile, traveling with the force as it plies the ocean or fights in the littorals. Conceptually, the battlespace is always perceived as the area in which one must dominate an adversary. Thus, the physical battlespace becomes the conceptual framework for planning the effort to defeat one's enemy.

The air force does not define "battlespace" but doctrinally address battlespace concepts present in both army and navy doctrine: the dimensions of the battlefield and the approach to controlling that battlefield. Air force doctrine defines a three-plane spatial environment characterized by perspective, speed,

range, and agility. Control of that environment -- dominating an adversary in the air -- is the first priority of air forces. Such control provides a force multiplication to sibling air, land, and sea forces freed from worry of attack from the air.

The marine corps similarly does not define battlespace but presents a combination of army and navy battlespace concepts in their doctrine. A conceptualization of the battlefield is an important precursor to operations on the battlefield. Space and time are integral components of that conceptualization, with a strong emphasis speed and maneuver. There is a deep, close, and rear organization and again the strong focus on dominating an adversary in the battlespace, and projecting power from the battlespace. As a service with both sea and land roots, the marine corps contains elements related to both navy and army thinking. The battlespace consistently is viewed as a spherical volume of irregular shape and size. Army doctrine defines a "physical volume ... that includes ... breadth, depth, and height"; navy and marine doctrine envision "zones of superiority, surrounding one or more units or even the entire force."[89] This volume adds a third spatial dimension to a ground force and accurately describes the image of a mobile, seaborne, land force.

Synthesis

The concept of battlespace thus reveals two faces. The first is that of a pseudo-battlefield rooted in pragmatic physical realities. The second is that of an

intellectual concept useful for planning to fight a very physically real enemy.

The physical realities are those of the physical battlefield. Most simply, "the battlespace is the sea, air, and land environment where we will conduct our operations."[90] Those environments are defined by their terrain, have multiple dimensions, are measured in concrete terms, and are shaped and bounded by the technologies a military force -- and its adversaries -- brings to the battlefield.

The "terrain" for each environment is the principle medium for the conduct of warfare; it varies dramatically between the services. The army views its battlefield primarily in terms of the ground it will fight on. A navy views its battlefield as the surface, subsurface, and airspace of and over the seas. An air force views all of the atmosphere and beyond as its purview. A marine corps views the world's littorals as their potential fighting ground. A service's principle warfighting medium is part of the real environment in which it operates.

That environment consists of spatial, temporal, and electromagnetic dimensions. The spatial dimension represents the breadth, depth, and height of the environment. The temporal dimension portrays the interval between events in the environment. The electromagnetic dimension represents a unique medium through which a force sees, communicates, and controls its weapons. These three dimensions -- space, time, and

electromagnetic -- can represent virtually every aspect of the modern battlefield environment.

Each of these dimensions is measured in concrete terms. Space is measured by units of distance, area, or volume, such as meters, square meters, or cubic meters. Time is measured by units of interval, such as seconds, minutes, hours, days. The electromagnetic spectrum is measured by the repetitions of the wavelike energy oscillating in the spectrum, expressed as a frequency in cycles per second. All such measurements provide an unambiguous way to relate events to each other in each of these dimensions, as well as across dimensions.

Finally, the technologies by which a force -- and its adversary -- operates in its physical environment shapes, bounds, and characterizes the lethality of that environment. A forces' ability to sense its enemy, communicate, and employ the preponderance of its weapons defines the size of an area in which it can effectively operate. For example, a ground maneuver division can conduct reconnaissance to a distance of approximately 30 kilometers; employ direct fire weapons to distance of approximately five kilometers; and employ its indirect fire weapons to a distance of approximately 30 kilometers. The shape of the environment depends on where the commander places those weapons on the battlefield and changes as the division alters formation.[91] As the division moves, so will this changing shape move with it. The boundaries will not be sharply defined; rather, there will be areas of greater

and lesser lethality dependent on the friendly and adversary capability to sense and shoot. Thus, technology will define the final elements of the environment -- shaping it, moving it, and characterizing its ability to protect a friendly force and kill an adversary one.

"Battlespace" is, however, not simply a 1990s term for "battlefield." Although rooted in the physical reality of the battlefield, battlespace transcends the battlefield concept to serve as an intellectual construct useful for combat planning. First, it provides for visualization of the battlefield in spatial, temporal, and electromagnetic dimensions. Spatially, that view is triplanar: height, in addition to breadth and depth. Temporally, the view is of speed, timing, and tempo. Electromagnetically, the view perceives the vast medium of electronic combat. Taken together, a vision of these dimensions "brings the maps to life" in a manner not probable from traditional IPB.[92]

Second, those same dimensions provide a natural framework for dominance throughout the battlefield. Success on the modern battlefield requires success in its three dimensions. In space, a force dominates through maneuver and fire. This is natural, although not simple. In time, a force dominates through timing and synchronizing the effects of their actions, and doing so at a tempo that confounds an adversary -- typically more quickly, but sometimes more slowly than can be matched. This is also intuitive but also

difficult to accomplish properly. Electromagnetically, a force dominates by exploiting the totality of the spectrum, by preserving spectrum for friendly use, and by doing so in a manner that prevents electromagnetic "fratricide." A combination of success in the three dimensions must be present. A force that maneuvers well but does so at the wrong times will not win. A force that synchronizes its actions but whose actions are feeble in terms of maneuver and fire will not win. A force, such as our own, that relies heavily on the electromagnetic spectrum for sensing, communicating, and targeting can be outmaneuvered or desynchronized if that spectrum is not dominated. By viewing the battlespace in those dimensions, and planning to dominate all three, a battlespace-literate force will plan properly for success.

Third, by focusing on dominance it focuses on an enemy -- sometimes a missing element in a view of the battlefield. "G-3's have a bad habit of drawing boundaries before they know what they have to dismember."[93] Dominating a battlespace implies defeating an adversary in that same space, or at least denying him use of that space. It also means understanding his battlespace -- his view of his own spatial, temporal, and electromagnetic shape and boundaries -- and dominating that battlespace as well. Such effort emphasizes an adversary's view of the battlefield, a crucial part of winning on that battlefield.

Standing thus with one foot rooted in the physical

reality of war, and one foot anchored in theory and concept, battlespace seems a good tool for the operational level planner, who must bridge strategy to tactics. Indeed it can be, especially as an addition to the "concepts of operational design"[94] in joint doctrine. Concepts of operational design are the "central" conceptual approaches to the "design and conduct of campaigns."[95] Current doctrinal concepts include center of gravity, lines of operation, and culminating point.[96] These concepts are physical and intellectual facilitators that planners use both to stimulate their thoughts on campaign design and to focus the efforts of their units on accomplishing operational objectives. With battlespace in the lineup, the planner would apply the other concepts within an expanded, alive, multi-dimensional, dominance and enemy-focused view of the battlefield.

A Joint Definition

Current joint doctrine, while rich with battlespace-like language, lacks a definition for the concept. The following definition is proposed to permit battlespace a place in operational design:

> Battlespace is both the physical environment in which a force fights and the conceptualization of the battlefield in space, time, and electromagnetic dimensions. It is mobile and malleable, shaped and bounded by where and when a commander places his forces, weapons, and sensors and by what the combat effects of those assets are intended to be. It includes, and should integrate, the combat power of all forces -- air, land, and sea -- operating in the space. It is the focus for dominance in all its dimensions.

This definition would require expansion in the joint doctrine and National Defense University courseware to develop each element of the definition more fully, explaining and providing examples. The army has done this in depth in FM 100-5 and TRADOC Pamphlets 525-200-3 and -4, as have the navy and marine corps in "Forward...From The Sea," NDP 1, and FMFM 3. The air force would have to include explanation in AFM 1-1.

Utility For The Joint Force Commander

Battlespace has useful operational application for the joint force commander, who must fulfill theater strategy through the tactical action of separate services. Although each service tends to take a unique view of *its* battlespace, a joint force commander also builds a vision for dominating an enemy and can use this view as well as his subordinate component views to arrive at an integrated plan that maximizes the combat potential of the forces under his command.

First, strong subordinate component views of their battlespace help build in the joint force commander the requisite composite "land, sea, and air mindedness" that he might be lacking based on his particular experience.[97] Such "jointness" based on simple, conceptually rich views educates the joint force commander rapidly and intuitively about the joint battlespace before him. He should then be a more effective commander, a command for which there is little schooling or experience.

Second, a common notion of battlespace facilitates subordinate component commanders sharing their

battlespace views with each other. This exchange would further educate the members of the joint staff, again intuitively and simply, on the perspective of their sister services involved in the campaign.

Third, the joint force commander can direct planning based on battlespace sensibilities; that is, planning that provides unity of effort for a particular mission. One area where this approach could enable planning is as a new perspective on "theater geometry."[98] Theater geometry is the theater "map" a joint force commander imposes to organize terrain, mission, and function.[99] It includes the theater of war; theater of operations; land, sea, and air areas of operation; and so forth. Naturally, this imposed geometry creates seams between the commands of two different officers. Managing those seams is the joint force commander's responsibility -- and headache. One such seam exists between air and ground forces in an area not in the current geometry lexicon: "close battle."[100]

One simple definition of the close battle is "a zone in which friendly ground forces are engaged."[101] This zone can be represented as a battlespace involving the land, the air, and potentially the sea within a certain radius surrounding such forces. Air, amphibious, land, and sea forces might all be involved in this battle. Were all such forces under separate command, the coordination of four different commanders, and their staffs, would be necessary. This is neither efficient nor practical. Designation of one commander

for this battle allows him to manage the seams between his specialized forces as he deems necessary. The close battle, and the seams within its battlespace, are directed with greatest efficiency and effect. This is similar to the marine corps "single battle" concept.

Thus, where the theater or area organization create boundaries for land and air areas of operation, for operational level planning the organization might instead use battlespace-relevant terms such as close, deep, high, rear, amphibious, maritime.[102] By using the battlespace to assign forces, mission, and terrain, the geometry can avoid unwieldy seams on the battlefield.

The result of the joint application of battlespace should be a synchronizing effect on the conduct of joint operations:

> Joint synchronization is the arrangement of land, sea, and air forces in time, space, and purpose to produce maximum relative combat power at the decisive point.[103]

As a joint concept of operational design, battlespace would join center of gravity, lines of operation, and culminating point in the operational planner's toolkit to help build a coherent campaign plan. Further, as a new perspective on theater geometry, battlespace could facilitate proper unity of effort and unity of command relationships. These are synchronizations at the operational level. At the tactical level, the inherent elements of battlespace -- dimension, dominance, and enemy -- mesh with the literal definition of synchronization by relating forces in space, time, and

purpose for decisive effect throughout the breadth and depth of the battlefield. Operationally and tactically, intellectually and physically, the concept of battlespace should establish the environment for a synergism among the elements under joint force command.

Conclusion

Battlespace is a term both straightforward and complex, both physical and intellectual. Each service gives it a slightly different meaning, and some give it no express meaning, but all of the services address its different aspects in various parts of their doctrine. Therein lies a path to a joint definition of battlespace and, more importantly, a joint *use* of battlespace as a concept that helps a joint commander synchronize his forces and their combat power.

Physically, the battlespace is the environment where combat is waged. The environment has multiple terrains, multiple dimensions, concrete measurements, and fuzzy but very real bounds. The terrain is simply the land, sea, or air -- the medium of the physical combat. The dimensions are the space, time, and electromagnetic continua by which the terrain is defined and in which forces exist. The measurements of those dimensions are concrete: distance, time, and frequency. These measurements depict the capabilities, and the limits, of what a force can influence -- the extent of its battlespace.

Intellectually, the battlespace is the commander's

image of his battlefield, providing a working framework for the effort to dominate an adversary in that space. That image consists of three spatial planes -- breadth, height, and depth -- unmarked by boundaries. It factors time as a natural dimension of this view. The image also contains the unseen but crucial dimension of the electromagnetic spectrum. These three dimensions frame the effort to dominate in the battlespace. Dominance maintains focus on an adversary, and includes that adversary's perception of his own battlespace.

As both a physical and intellectual concept, battlespace bridges the physical and intellectual realms. As the bridge between tactics and strategy, operations -- and the operational art -- provide a natural home for battlespace. Physically, battlespace presents a potential for organizing the battlefield the way we fight: close, deep, high, rear, and so forth. This would enable the founding tenets of the battlespace concept: unity of effort and synchronization. Conceptually, battlespace deserves status as a concept of operational design alongside center of gravity, lines of operation, and culminating point. These concepts guide the thinking that plans the campaign, "a sequence of related military operations designed to achieve a strategic objective within a given time and space."[104] Inherently involved with time and space itself, battlespace is an intuitive tool by which the operational artist can construct the campaign plan.

Battlespace can be a utilitarian concept for the

joint force commander as well. It can help build crucial "jointness" for the joint force commander in an intense, learning situation. It can promote subordinate component understanding of each other's tasks and views. Finally, it can help overcome the "tyranny of boundaries"[105] when overlaying geometry on the theater, unifying effort and command and control within logical joint battlespaces.

In sum, if the concept of battlespace helps build a spatial, temporal, and electromagnetic image of the battlefield for the friendly force; if it provides a framework by which to focus on dominance of an adversary; if it aids the planner to construct a holistic campaign plan; if it enables the joint force commander to synchronize his forces and achieve unity of effort within the different battles under his command; then battlespace will have justified its inclusion as a concept of operational design and an element of the battlefield framework.

NOTES

1 WordStar International Incorporated, The American Heritage Dictionary (Novato, CA: Star Press, 1993), Third Edition, electronic version.

2 Department of the Army, FM 100-5: Operations (Washington, DC: US Government Printing Office, June 1993), Glossary-6.

3 The American Heritage Dictionary, ibid.

4 Ibid.

5 Ibid.

6 Ibid.

7 DA, FM 100-5, 6-13.

8 Department of the Navy, Office of the Chief of Naval Operations and Headquarters, United States Marine Corps, Naval Doctrine Publication 1: Naval Warfare (Washington, DC: US Government Printing Office, 1994), 72.

9 DA, FM 100-5, Glossary-1.

10 Department of the Navy, Headquarters United States Marine Corps, FMFM 1: Warfighting (Washington, DC: US Government Printing Office, 1989), 58-59.

11 Aerospace roles and missions are portrayed briefly in Department of the Air Force, AFM 1-1, Volume I: Basic Aerospace Doctrine of the United States Air Force (Washington, DC: US Government Printing Office, 1992), 10-15. The "combat environment" is not further defined; the "aerospace environment" receives expanded treatment in AFM 1-1, Volume II, 63-70. Similar expansion of "aerospace power roles and missions" is found in AFM 1-1, Volume II, 103-112; "orchestrating aerospace control" is the topic of pp. 135-146.

12 Thom W. Ford, "The Services Must Come To Terms On Battlespace" (Fort Leavenworth, KS: unpublished paper, undated), all. CAPT Ford, Commander, US Navy

Detachment, US Army Command and General Staff College, posits that a joint definition of battlespace, crucial of itself to understanding naval warfare, is further important to joint warfare. Indeed, CAPT Ford's paper is the premise for much of the study and conclusions of this monograph.

13 DN, NDP 1, 63-64.

14 Ibid, 72. "Battlespace dominance" is a concept strongly emphasized by the Navy and Marine Corps.

15 DA, FM 100-5, 6-12.

16 Ibid.

17 Ibid, 6-13.

18 James A. Blackwell, Jr., lecture to Advanced Military Studies Program, School of Advanced Military Studies, US Army Command and General Staff College (Fort Leavenworth, KS: 12 Dec 94).

19 DA, FM 100-5, 6-11 to 6-15.

20 Ibid, Glossary-0 and 6-12.

21 Ibid, 6-14 to 6-15.

22 Ibid, 6-12.

23 Ibid, 6-12 to 6-13. "Time" is not accorded development in and of itself in the doctrinal writing; rather, it is referred to throughout the section on battle space. For example, there is the statement, "Battle space...includes the operational dimensions of combat, including time, tempo, depth, and synchronization."

24 Ibid, 6-12.

25 Ibid, 6-12.

26 Ibid, 6-13.

[27] Information for this paragraph is taken from Lon E. Maggart and Gregory Fontenot, "Breaching Operations: Implications for Battle Command and Battle Space," Military Review (Fort Leavenworth, KS: Volume LXXIV, No. 2, February 1994), 19-35.

[28] Maggart and Fontenot, "Breaching Operations," Military Review, 21-22.

[29] Ibid, 26.

[30] Ibid.

[31] Ibid, 31-33.

[32] US, Department of Defense, The Joint Chiefs of Staff, Joint Pub 1-02: Department of Defense Dictionary of Military and Associated Terms (Washington, DC: US Government Printing Office, 29 March 1994), 33.

[33] Ibid, 33.

[34] Concepts for this paragraph are derived from NDP 1, 63-64.

[35] One of the reasons for this is the fact that "Battlespace Dominance" is the title of the section on battlespace in NDP 1. It is striking still that every naval officer queried about battlespace during research for this monograph -- four in all -- immediately used "battlespace dominance" when discussing the author's offered term of "battlespace."

[36] DN, NDP 1, 63.

[37] Max Hastings and Simon Jenkins, The Battle For The Falklands (New York, NY: W. W. Norton and Company, 1983), 95, 114, 346-354.

[38] Ibid, 147-150, 158, 129.

[39] Ibid, 316.

[40] Ibid, 116, 152, 159, 162, 317.

41 AFM 1-1, Vol II, 63.

42 Ibid, 63-65.

43 Ibid, 65.

44 Ibid, 65, 79, 80.

45 AFM 1-1, Vol I, 10, and Vol II, 136.

46 AFM 1-1, Vol II, 136.

47 AFM 1-1, Vol I, 11.

48 Ibid, 13.

49 AFM 1-1, Vol II, 137.

50 AFM 1-1, Vol I, 10.

51 AFM 1-1, Vol II, 137.

52 Ibid, 104.

53 Ibid, 104.

54 Ibid, 138-141.

55 AFM 1-1, Vol I, 10.

56 Thomas A. Keaney and Eliot A. Cohen, Gulf War Air Power Survey Summary Report (Washington, DC: US Government Printing Office, 1993), 58.

57 Ibid, 59.

58 Ibid, 61.

59 Ibid.

60 AFM 1-1, Vol II, 273.

61 Keaney and Cohen, GWAPS, 64-65.

62 Department of the Navy, Headquarters United States Marine Corps, FMFM 1-3: Tactics (Washington, DC: US Government Printing Office, June 1991), 14.

63 Ibid, 15.

64 See Department of the Navy, Headquarters United States Marine Corps, FMFM 1: Warfighting (Washington, DC: US Government Printing Office, March 1989), 66, on "shaping the battle." *Coup d'oeil* is "the ability to look at a military situation and immediately see its essence, especially the key enemy weakness or weaknesses which...can lead to a decision." It is the product of training, education, experience, and sheer intellect; some consider it the mark of military genius. Whether innate or coached, it sparks the conceptualization process. See FMFM 1-3, 16.

65 FMFM 1, 66.

66 FMFM 1-3, 15.

67 FMFM 1, 66.

68 FMFM 1, 66 and FMFM 1-3, 15.

69 FMFM 1, 32. Actually, velocity is the derivative of distance as a function of time.

70 Ibid.

71 Ibid, 32.

72 Ibid, 32.

73 Ibid, 34.

74 Ibid, 35.

75 Department of the Navy, Headquarters United States Marine Corps, FMFM 3: Command and Control

(Washington, DC: US Government Printing Office, June 1993), 24.

76 Ibid.

77 Ibid.

78 Ibid.

79 Glen R. Sachtleben, "Operation SHARP EDGE: The Corps' MEU(SOC) Program in Action, Marine Corps Gazette (Quantico, VA: Marine Corps Association, November 1991), 77. The Commander-in-Chief, Europe, stood-up a Joint Task Force to conduct the NEO, naming the Commander, Sixth Fleet as JTF commander. While forces from all four US military services participated in the NEO, most notably naval forces comprising the Amphibious Ready Group transporting the MEU, the preponderance of forces ashore and the Commander, Landing Force were marines.

80 T.W. Parker, "Operation Sharp Edge", Naval Institute Proceedings (Annapolis, MD: US Naval Institute, May 1991), 103.

81 Sachtleben, 86; Parker, 106. Foreign nationals represented the majority of noncombatants evacuated, with Americans totaling only 226 of the more than 2,400 evacuees during the seven months. See Sachtleben, 77.

82 Sachtleben, 79; Parker, 103-104.

83 Sachtleben, 79; Parker, 104.

84 Ibid.

85 Sachtleben, 84-86; Parker, 104-106.

86 Sachtleben, 82.

87 DA, FM 100-5, 6-12.

88 Ibid, 6-11 to 6-15.

89 Ibid, 6-12; NDP 1, 63. See also FMFM 3, 24.

90 Department of the Navy, ...From The Sea (Washington, DC: US Government Printing Office, 1992), 8.

91 DA, FM 100-5, 6-12.

92 Gregory Fontenot, lecture to Advanced Military Studies Program, School of Advanced Military Studies (Fort Leavenworth, KS: USACGSC, 17 Mar 95).

93 Richard E. Cavazos, lecture to Advanced Military Studies Program, School of Advanced Military Studies (Fort Leavenworth, KS: USACGSC, 13 Mar 95). GEN Cavazos (USA, Retired) decried the "tyranny of boundaries [that don't] follow the natural flow of terrain to the objective."

94 Department of Defense, National Defense University, Armed Forces Staff College, AFSC Pub 2: Service Warfighting Philosophy and Synchronization of Joint Forces (Norfolk, VA: NDU, 1992), II-3-8.

95 Ibid.

96 Ibid, II-3-8 to II-3-12.

97 Robert M. Epstein, lecture to Advanced Military Studies Program, School of Advanced Military Studies (Fort Leavenworth, KS: USACGSC, 21 Apr 95).

98 AFSC Pub 2, II-3-15.

99 Ibid, II-3-15 to II-3-18.

100 "Close battle" does not correlate to the "close operations" of the current army "battlefield organization." (See FM 100-5, 6-13 to 6-15.) Rather, close battle comprises the entire zone of "deep, close, and rear" operations on the ground, "however dynamic or 'deep' it is." See Merrill A. McPeak, "The Roles and Missions Opportunity", Armed Forces Journal International (Washington,DC: March 1995), 33.

101 McPeak, AFJI, 33. The general concept of this paragraph stems from ideas contained in the article, pp. 32-34.

102 McPeak, "Roles and Missions," AFJI, 33. "Rear", "Amphibious", and "Maritime" are in the current theater organization vocabulary today. See AFSC Pub 2, II-3-17.

103 AFSC Pub 2, II-1-3.

104 AFSC Pub 2, G-3.

105 Richard E. Cavazos, lecture to Advanced Military Studies Program, School of Advanced Military Studies (Fort Leavenworth, KS: USACGSC, 13 Mar 95).

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